REMARKS

The above amendment and remarks to follow are intended to be fully responsive to the issues presented in the non-final action mailed July 19, 2004.

Claims 1-18 are rejected under the judicially created doctrine of oobviousness-type double patenting as being unpatentable over US Patent 6,517,462 in view of Onodera (USP 4,625,584). Applicant respectfully requests that the issue of obviousness-type double patenting be held in abeyance until the prior art rejections are resolved.

Claims 1-8 and 10-18 were rejected under 35 U.S.C. §103(a) as being unpatentable over Balmforth (USP 4,914,979) in view of Hunt (USP 5,996,720). Claims 1-8 and 10-18 were rejected under 35 U.S.C. §103(a) as being unpatentable over Balmforth (USP 4,914,979) in view of Onodera (US Patent 4,625,584). These rejections are respectfully traversed in view of the above amendment and the following comments.

No prior art teaches an axle disconnect assembly for a tandem vehicle whereby two axles are disconnected from their associated differential. The examiner incorrectly asserts that Balmforth '979 teaches a second clutch means as shown in figure 7 which engages and disengages the axle shafts 111, 112 of a third drive axle from a differential assembly. There is no mechanism in Balmforth '979 whereby the axle shafts 111, 112 can be disconnected from the differential 110.

Hunt '720 teaches a slidable clutch collar 34 and gears 30 – but Hunt '720 does not teach slidable axle shafts.

Onodera '584 teaches a single slidable axle that may be disconnected from a wheel end. The single slidable axle of Onodera '584 is not disconnected from the differential side gears, and Onodera '584 fails to teach or render obvious an assembly where both axles are slidable with respect to the differential. The single slidable axle of Onodera '584 is moved by the connecting rod 36.

This invention is a system whereby axles of a tandem or multi-axle vehicle may be easily and quickly engaged and disengaged as required. The present invention allows the ring gear and differential gears to remain stationary when the axle is disengaged.

In multi-axle vehicles such as illustrated in Figure 1, a dual disconnect mechanism is contained in the front axle 1 and auxiliary rear axle 7. When only the primary rear axle 4 is necessary to propel the vehicle (e.g., during highway use) the transfer case 3 interrupts torque to the front axle 1. Similarly, a clutch 6 also interrupts torque transmission to the auxiliary rear axle 7. In this mode, the dual disconnect mechanism of this invention prevents the output shafts of the front axle 1 auxiliary rear axle 7 from back-driving their respective differentials 2, 8, thereby reducing parasitic losses and wear.

This invention comprises a differential having first and second side gears 20 and 21, which are rotatable about a common transverse axis. Rotatable first and second output shafts 24, 25 are co-axial with the side gears 20 and 21, and a clutch mechanism (36, 38, 40, 41) is used for

placing the output shafts 24, 25 simultaneously into or simultaneously out of driving engagement with the respective side gears 20, 21. An actuator is used to slidably and concurrently move the driven axles 24, 25 between the clutch engaging position and the clutch disengaging position.

According to one important aspect of this invention, the first and second axle shafts 24, 25 are interconnected and axially slidable together as a unit. In other words, the present invention preferably provides a linking member 29 in the form of a linking rod or other suitable member that extends through the differential assembly to connect the two axle shafts 24, 25. With this arrangement, the invention provides simultaneous axial movement of the axle shafts to thereby mutually disconnect the first and second axle shafts 24, 25 from the first and second side gears 20, 21. In the embodiment of Figures 2 and 3, the linking rod passes through the cross pin 16. In the alternate embodiment of Figure 5, the linking member 129 takes the form of a connecting sleeve that connects the axle shafts 24, 25. In the arrangement of Figure 5, the cross pin 16 passes through the connecting sleeve 129 at apertures 130. In both illustrated designs, the two driven axle shafts 24, 25 are securely linked together to provide mutual linear sliding movement between the clutch engaged and disengaged positions.

The dual disconnect differential assembly of this invention includes a clutch mechanism for simultaneously placing both output shafts 24 either into or out of driving engagement with respective side gears 20, 21. The splines 22, 23 on respective side gears 20, 21 form part of this clutch assembly or mechanism.

Regarding the structure of the present invention, the prior art fails to teach or render obvious any arrangement whereby the axle shafts (e.g., axle shaft 24, 25) are axially slidable with

respect to their associated differential assembly. Hunt '720 teaches a slidable clutch collar 34 and gears 30 – but Hunt '720 does not teach slidable axle shafts. Onodera '584

Because the prior art fails to teach or render obvious an arrangement where two axles slide relative to their central differential to disengage the axles from the differential, it is respectfully submitted that this application is in condition for allowance and notice to that effect is earnestly solicited. Should the Examiners believe additional discussion would advance the prosecution of the instant application, please contact the undersigned.

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